AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (original): A radiation image read-out method, comprising the steps of:

i) irradiating stimulating rays, which have been produced by a line light source, linearly along a main scanning direction and onto a stimulable phosphor sheet, on which a radiation image has been stored, the stimulating rays causing the stimulable phosphor sheet to emit light in proportion to an amount of energy stored on the stimulable phosphor sheet during exposure of the stimulable phosphor sheet to radiation,

ii) receiving light, which is emitted from the linear area of the stimulable phosphor sheet exposed to the linear stimulating rays, with a line sensor comprising a plurality of photoelectric conversion devices arrayed along the main scanning direction, the received light being subjected to photoelectric conversion performed by the line sensor,

iii) moving the stimulable phosphor sheet with respect to the line light source and the line sensor and in a sub-scanning direction different from the main scanning direction, and

iv) successively acquiring output signal components from the photoelectric conversion devices of the line sensor in accordance with the movement, whereby an operation for reading out the radiation image from the stimulable phosphor sheet is performed, wherein the improvement comprises the provision of the steps of:

a) previously storing reference signal components having been obtained in an initial state from the outputs of the photoelectric conversion devices of the line sensor, which has received reference light produced by a reference light source,

b) causing the line sensor to receive the reference light, which is produced by the reference light source, at a stage immediately before the operation for reading out the radiation image from the stimulable phosphor sheet is performed,

c) acquiring sensitivity signal components from the outputs of the photoelectric conversion devices of the line sensor having received the reference light, which is produced by the reference light source, at the stage immediately before the operation for reading out the radiation image from the stimulable phosphor sheet is performed,

d) comparing the sensitivity signal components and the corresponding reference signal components with each other, sensitivity correction signal components for making a correction for variations in sensitivity among the photoelectric conversion devices of the line sensor being obtained from the comparison, and

e) making a correction of the output signal components, which are acquired from the photoelectric conversion devices of the line sensor at the time of the operation for reading out the radiation image from the stimulable phosphor sheet, by use of the sensitivity correction signal components.

2. (original): A method as defined in claim 1 wherein the sensitivity correction signal components are subjected to low frequency component removing processing, and

the correction of the output signal components, which are acquired from the photoelectric conversion devices of the line sensor at the time of the operation for reading out the radiation image from the stimulable phosphor sheet, is made by use of the sensitivity correction signal components, which have been subjected to the low frequency component removing processing.

3. (original): A method as defined in claim 1 wherein the stimulable phosphor sheet contains a stimulable phosphor, which is capable of absorbing light having wavelengths falling within a ultraviolet to visible region and thereby storing energy of the light having wavelengths falling within the ultraviolet to visible region, and which is capable of being stimulated by light having wavelengths falling within a visible to infrared region and thereby radiating out the stored energy as emitted light.

4. (original): A method as defined in claim 2 wherein the stimulable phosphor sheet contains a stimulable phosphor, which is capable of absorbing light having wavelengths falling within a ultraviolet to visible region and thereby storing energy of the light having wavelengths falling within the ultraviolet to visible region, and which is capable of being stimulated by light having wavelengths falling within a visible to infrared region and thereby radiating out the stored energy as emitted light.

5. (original): A radiation image read-out apparatus, comprising:

i) a line light source for irradiating stimulating rays linearly along a main scanning direction and onto a stimulable phosphor sheet, on which a radiation image has been stored, the stimulating rays causing the stimulable phosphor sheet to emit light in proportion to an amount of energy stored on the stimulable phosphor sheet during exposure of the stimulable phosphor sheet to radiation,

ii) a line sensor for receiving light, which is emitted from the linear area of the stimulable phosphor sheet exposed to the linear stimulating rays, and performing photoelectric conversion of the received light, the line sensor comprising a plurality of photoelectric conversion devices arrayed along the main scanning direction,

iii) sub-scanning means for moving the stimulable phosphor sheet with respect to the line light source and the line sensor and in a sub-scanning direction different from the main scanning direction, and

iv) read-out means for successively acquiring output signal components from the photoelectric conversion devices of the line sensor in accordance with the movement, and thereby performing an operation for reading out the radiation image from the stimulable phosphor sheet, wherein the improvement comprises the provision of:

a) a reference light source for projecting reference light onto the line sensor,

b) sensitivity signal component acquiring means for acquiring sensitivity signal components from the outputs of the photoelectric conversion devices of the line sensor having received the reference light, which is produced by the reference light source,

c) reference signal component storing means for storing the sensitivity signal components, which have been acquired in an initial state by the sensitivity signal component acquiring means, as reference signal components,

d) correction signal component calculating means for comparing sensitivity signal components, which have been acquired by the sensitivity signal component acquiring means at a stage immediately before the operation for reading out the radiation image from the stimulable phosphor sheet is performed, and the corresponding reference signal components, which have been stored in the reference signal component storing means, with each other in order to obtain sensitivity correction signal components for making a correction for variations in sensitivity among the photoelectric conversion devices of the line sensor, and

e) correction means for making a correction of the output signal components, which are acquired from the photoelectric conversion devices of the line sensor at the time of the operation for reading out the radiation image from the stimulable phosphor sheet, by use of the sensitivity correction signal components.

6. (original): An apparatus as defined in claim 5 wherein the sensitivity correction signal components are subjected to low spatial frequency component removing processing, and

the correction means makes the correction of the output signal components, which are acquired from the photoelectric conversion devices of the line sensor at the time of the operation for reading out the radiation image from the stimulable phosphor sheet, by use of the sensitivity

correction signal components, which have been subjected to the low spatial frequency component removing processing.

7. (original): An apparatus as defined in claim 5 wherein the stimulable phosphor sheet contains a stimulable phosphor, which is capable of absorbing light having wavelengths falling within a ultraviolet to visible region and thereby storing energy of the light having wavelengths falling within the ultraviolet to visible region, and which is capable of being stimulated by light having wavelengths falling within a visible to infrared region and thereby radiating out the stored energy as emitted light.

8. (original): An apparatus as defined in claim 6 wherein the stimulable phosphor sheet contains a stimulable phosphor, which is capable of absorbing light having wavelengths falling within a ultraviolet to visible region and thereby storing energy of the light having wavelengths falling within the ultraviolet to visible region, and which is capable of being stimulated by light having wavelengths falling within a visible to infrared region and thereby radiating out the stored energy as emitted light.

9. (previously presented): The method as defined in claim 1, wherein the initial state is a state of the reference light source when newly installed or replaced or when the stimulable phosphor sheet is replaced.

10. (previously presented): The apparatus as defined in claim 5, wherein the initial state is a state of the reference light source when newly installed or replaced or when the stimulable phosphor sheet is replaced.

11. (previously presented): The apparatus as defined in claim 5, further comprising: a dust removing device to remove dust from a surface of the reference light source.

12. (previously presented): The apparatus as defined in claim 11, wherein the dust removing device utilizes one of air, a brush and electrostatic attraction to remove the dust.

13. (currently amended): The method as defined in ~~claim 1~~claim 2, wherein the low frequency component removing process is one of unsharp masking processing and median filtering processing.

14. (currently amended): The apparatus as defined in ~~claim 5~~claim 6, wherein the low spatial frequency component removing process is one of unsharp masking processing and median filtering processing.

15. (previously presented): The method as defined in claim 1, wherein the obtaining of the sensitivity correction signal components includes determining whether the sensitivity

signal components contain a discontinuous region that represents a defective pixel on the line sensor.

16. (previously presented): The apparatus as defined in claim 5, wherein the obtaining of the sensitivity correction signal components includes determining whether the sensitivity signal components contain a discontinuous region that represents a defective pixel on the line sensor.

17. (previously presented): The method as defined in claim 1, wherein the output signal components correction includes dark correction and shading correction.

18. (previously presented): The apparatus as defined in claim 5, wherein the output signal components correction includes dark correction and shading correction.

19. (previously presented): A radiation image read-out apparatus, comprising:

i) a line light source for irradiating stimulating rays linearly along a main scanning direction and onto a stimulable phosphor sheet, on which a radiation image has been stored, the stimulating rays causing the stimulable phosphor sheet to emit light in proportion to an amount of energy stored on the stimulable phosphor sheet during exposure of the stimulable phosphor sheet to radiation,

ii) a line sensor for receiving light, which is emitted from the linear area of the stimulable phosphor sheet exposed to the linear stimulating rays, and performing photoelectric conversion of the received light, the line sensor comprising a plurality of photoelectric conversion devices arrayed along the main scanning direction,

iii) sub-scanning device that moves the stimulable phosphor sheet with respect to the line light source and the line sensor and in a sub-scanning direction different from the main scanning direction, and

iv) read-out circuit that successively acquires output signal components from the photoelectric conversion devices of the line sensor in accordance with the movement, and thereby performing an operation for reading out the radiation image from the stimulable phosphor sheet, wherein the improvement comprises the provision of:

a) a reference light source for projecting reference light onto the line sensor,

b) sensitivity signal component acquiring circuit that acquires sensitivity signal components from the outputs of the photoelectric conversion devices of the line sensor having received the reference light, which is produced by the reference light source,

c) reference signal component storage that stores the sensitivity signal components, which have been acquired in an initial state by the sensitivity signal component acquiring circuit, as reference signal components,

d) correction signal component calculating circuit that compares sensitivity signal components, which have been acquired by the sensitivity signal component acquiring circuit at a stage immediately before the operation for reading out the radiation image from the stimulable

phosphor sheet is performed, and the corresponding reference signal components, which have been stored in the reference signal component storage, with each other in order to obtain sensitivity correction signal components for making a correction for variations in sensitivity among the photoelectric conversion devices of the line sensor, and

e) correction circuit for making a correction of the output signal components, which are acquired from the photoelectric conversion devices of the line sensor at the time of the operation for reading out the radiation image from the stimulable phosphor sheet, by use of the sensitivity correction signal components.

20. (previously presented): An apparatus as defined in claim 19 wherein the sensitivity correction signal components are subjected to low spatial frequency component removing processing, and

the correction circuit makes the correction of the output signal components, which are acquired from the photoelectric conversion devices of the line sensor at the time of the operation for reading out the radiation image from the stimulable phosphor sheet, by use of the sensitivity correction signal components, which have been subjected to the low spatial frequency component removing processing.